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30 NOV 1965

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Requested Information on Tin

1. This memorandum is for information only. It is in response to your questions concerning (a) the importance of tin in modern technology, and (b) what possible substitutes for tin are available.

2. Generally the largest use for tin is as a protective coating for sheet steel. As an example, tinplate for cans consumes 50-60 percent of the approximately 50,000 long tons of primary tin used annually in the U.S. Similar tin coatings are used on copper wire and electrical connections to prevent corrosion and to facilitate soldering. The second largest use of tin is in tin-lead solders, an application that requires about 20 percent of the annual U.S. primary tin supply. Bronze and brass making is the third largest use for primary tin, but large quantities of reclaimed tin also are used. Substantial quantities of tin are used in producing babbitt bearings, pewter, type metal, and in die casting alloys. Small quantities of tin are consumed in the production of chemical reagents and in making glass, ceramics, and other products. Recently developed organotin compounds are used as stabilizers in plastics, wood preservatives, fungicides, and insecticides.

3. The question of possible substitutes for tin is an important one because the U.S. is dependent upon foreign sources of supply, with the exception of the 314,000 long tons (as of June 1964) that are stockpiled for emergency use. Of the total estimated reserves of 4.7 million long tons of tin in the free world, 3 million tons are in Burma, Indonesia, Malaysia, and Thailand, 1.5 million tons are located in the Congo and Nigeria, 0.75 million tons are in Bolivia, and the balance is scattered. The search for substitute materials is being intensified. Vacuum packed glass jars, enameled steel cans, and aluminum frozen drink containers are typical substitutes that have been developed for "tin" food cans. Coated paper, aluminum, and plastic containers

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for nonfood products also are coming into widespread use. At the same time, the rising standard of living results in additional requirements for tinplate and solder for canning. (In 1964, U.S. tinplate production increased 12 percent above 1963). Silver or antimony may be used in place of tin in some solder, and plastic, aluminum, and chromium coatings on steel may help reduce total tin requirements. Nevertheless, for the next 5 to 7 years it will be necessary to continue to release excess tin from the U.S. national stockpile to help make up the present deficit between world production and consumption. If political or economic upheavals were to take place in the major tin-producing countries, a further shortage could result, but the following would ease a critical supply situation: (a) more extensive substitution, (b) increased releases from the national stockpile, and (c) more efficient means for tin recovery from ores, secondary materials, and tin-smelter slags.

ALBERT D. WHEELON
Deputy Director
for
Science and Technology

Signature Recommended:

Acting Director/Scientific Intelligence

24 Nov 65
Date

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